

**To:** Morrison, Richard S. (ARC-QS)[richard.s.morrison@nasa.gov]; Chirayath, Ved (ARC-SG)[ved.chirayath@nasa.gov]; Fladeland, Matthew M. (ARC-SG)[matthew.fladeland@nasa.gov]  
**Cc:** Gullett, Brian[Gullett.Brian@epa.gov]; Phillips, Stanleigh W. (ARC-QH)[stanleigh.w.phillips@nasa.gov]; Dearing, Munro G. (ARC-JO)[munro.g.dearing@nasa.gov]; Mendoza, Donald R. (ARC-QS)[donald.r.mendoza@nasa.gov]  
**From:** KAN, WAI KWONG (ARC-QH)  
**Sent:** Thur 9/15/2016 1:18:45 AM  
**Subject:** RE: Whom to work with on risk mitigation for Radford

All:

I reviewed the NRMRL Quality Assurance Project Plan (Characterization of Air Emissions from open burning at Radford Army Ammunition Plant) and came to the same conclusion as what Richard Morrison stated below. The Safety Office need to review document spelling out the hazards associated with the project and how the hazards are being controlled. Job hazard analysis for the project or something similar is what we need. Thank you

Wai Kwong Kan, CIH

Industrial Hygienist

Tel: 650 604-5172

Cell: 650 603-6234

**From:** Morrison, Richard S. (ARC-QS)  
**Sent:** Wednesday, September 14, 2016 5:33 PM  
**To:** Chirayath, Ved (ARC-SG); Fladeland, Matthew M. (ARC-SG)  
**Cc:** Gullett, Brian; KAN, WAI KWONG (ARC-QH); Phillips, Stanleigh W. (ARC-QH); Dearing, Munro G. (ARC-JO); Mendoza, Donald R. (ARC-QS)  
**Subject:** RE: Whom to work with on risk mitigation for Radford

Ved & Matt,

Thanks for the plan, it very insightful as to what the overall project and process is about.

However, I've performed a quick read of the plan. While it's a fairly good program plan, it is not a Safety Plan.

It does not describes the potential hazards. Although one can infer there are hazards by examining the chemicals listed and the described operations.

It does not provide procedures to assure safety of test personnel.

It does not even identify who is responsible for safety.

It does not provide decontamination and handling procedures for the aircraft after it been exposed to the plume.

There has got to something else, I suspect the Army has a safety plan (they may call it something different) , and is the safety authority for this test, but this plan is not it.

Can you send be the draft of your Safety and Mishap Plan?

Again good project plan, it's just not a safety plan or procedures.

Regards,

Rich

On you comment #4 below, the army folks you talk about are probably the folks with THE safety plan. (I would be shocked if it doesn't exist.) It doesn't have to be all the formal, but it does have ensure safety for these operations.

**From:** Morrison, Richard S. (ARC-QS)  
**Sent:** Wednesday, September 14, 2016 3:26 PM  
**To:** Chirayath, Ved (ARC-SG) <[ved.chirayath@nasa.gov](mailto:ved.chirayath@nasa.gov)>  
**Cc:** Fladeland, Matthew M. (ARC-SG) <[matthew.fladeland@nasa.gov](mailto:matthew.fladeland@nasa.gov)>; Gullett, Brian <[Gullett.Brian@epa.gov](mailto:Gullett.Brian@epa.gov)>; Wai Kwong Kan (ARC-QH) <[waikwong.kan@nasa.gov](mailto:waikwong.kan@nasa.gov)>; Phillips, Stanleigh W. (ARC-QH) <[Stanleigh.W.Phillips@nasa.gov](mailto:Stanleigh.W.Phillips@nasa.gov)>; Dearing, Munro G. (ARC-JO) <[munro.g.dearing@nasa.gov](mailto:munro.g.dearing@nasa.gov)>  
**Subject:** RE: Whom to work with on risk mitigation for Radford

Ved,

First time I've seen a 9-13-2016 version of the plan. Is there a signed version? (this one is still stamped draft)

I'll review it shortly. Wai on the cc line is the Industrial hygienist, for us. Has the Army Range Safety signed off on it?

On your item #5: Keep in mind ALL hazard operations must be reviewed by the safety office, regardless of whether its an extreme environment or not.

On your item #4: That's good news, please send me an artifact from the Army that says that. Earlier you said bunny suits and respirator. Let's write it down.

Can we maintain a safe distance while maintaining visual contact with the UAV?

Regards,

Rich

**From:** Chirayath, Ved (ARC-SG)

**Sent:** Wednesday, September 14, 2016 3:05 PM

**To:** Morrison, Richard S. (ARC-QS) <[richard.s.morrison@nasa.gov](mailto:richard.s.morrison@nasa.gov)>

**Cc:** Fladeland, Matthew M. (ARC-SG) <[matthew.fladeland@nasa.gov](mailto:matthew.fladeland@nasa.gov)>; Gullett, Brian <[Gullett.Brian@epa.gov](mailto:Gullett.Brian@epa.gov)>

**Subject:** Whom to work with on risk mitigation for Radford

Hi Rich,

We are working to address the issues you raised regarding decontamination of the aircraft and crew protections. Can you put us in touch with the industrial hygienist required to review this? I have attached the latest quality assurance plan prepared by Brian Gullett.

A few important notes and mitigations:

1. The Army does not allow any of our personnel or EPA personnel into the burning range.
2. The EPA states there are no volatile compounds involved and that the decontamination is really only to remove any potential soot. This is nonvolatile. More akin to charcoal soot (amorphous carbon) from a BBQ.
3. Brian is working with the Army to provide additional material on safety and procedures.
4. The Army requires us to remain away from the burn site as indicated in FRR documentation. Due to this distance, they have now determined we do not need any special suits on the Army base.
5. Our EERB concluded no review was necessary for this mission as we are outside the burn range.

Best,

Ved Chirayath, Ph.D.

Research Scientist

Earth Sciences Division

NASA Ames Laboratory for Advanced Sensing

[www.nasa.gov/ames/las](http://www.nasa.gov/ames/las)

[Chair, NASA Ames LGBTQIA Advisory Group](#)

NASA Ames Research Center

Sustainability Base (N-232), Room 267

Office: (650) 604-6278

Cell: (949) 413-8928

[ved.chirayath@nasa.gov](mailto:ved.chirayath@nasa.gov)